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10/586,668	07/20/2006	Jean Gobet	09894.0018-00	8060

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EXAMINER
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DIETERLE, JENNIFER M

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/586,668	<b>Applicant(s)</b> GOBET ET AL.	
	<b>Examiner</b> Jennifer Dieterle	<b>Art Unit</b> 4111	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 20 July 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 17-36 is/are pending in the application.
- 4a) Of the above claim(s) 33-36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 17-36 are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/20/06;11/6/06</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Status of Claims***

Claims 1-16 have been canceled.

Claims 17-36 are pending.

Claims 33-36 have been restricted without traverse.

Claims 17-32 are being examined.

### ***Election/Restrictions***

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

- Group I, claim(s) 17-32, drawn to an electrode system for an electrochemical cell.
- Group II, claim(s) 33-36, drawn to a process for producing a measurement electrode of an electrode system utilizing etching.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Both groups I and II share the feature of a electrically conducting substrate. However, Butler (US 4,062,750)

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teaches an electrochemical cell and electrode system comprising an electrically conductive substate (col. 1, lines 5-7; col. 7, lines 58-64). Therefore, the common feature between both groups, an electrically conducting substrate, does not provide a contribution over the prior art, and, thus, cannot be a special technical feature.

Therefore, Groups I and II do not relate to a single inventive concept under PCT Rule 13.1.

During a telephone conversation with David Longo on June 1, 2009 a provisional election was made without traverse to prosecute the invention of Group 1, claims 17-32. Affirmation of this election must be made by applicant in replying to this Office action. Claims 33-36 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the requirement be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 17, 18, 29, 30 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Butler (US 4,062,750).

Regarding claims 17 and 18, Butler discloses an electrode system for an electrochemical cell (col. 1, lines 5-6; col. 2, lines 15-16) comprising:

- an electrically conductive substrate (fig. 2, #25; col. 7, lines 58-64);
- an electrically insulating layer deposited on the substrate and pierced with a plurality of circular orifices (fig. 1; fig. 2, #26 and col. 3, lines 38-41);
- an electrically conductive layer (fig. 2, #27 – gold cathodes and #28 – chromium conductive layer) deposited in said orifices in contact with the substrate and on a portion of the insulating layer (fig. 2, #26) that surrounds them, forming a plurality of microdisks, which form measuring electrodes (col. 3, lines 35-42); and
- an electrically conductive layer (fig. 2, #29) deposited on the insulating layer (#26), pierced with circular orifices of larger diameter than that of the microdisks and arranged such that each orifice is concentric with a microdisk, said layer forming a generating electrode (#29).

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Regarding claims 29 and 30, Butler teaches an electrode that meets the limitations specified in applicants' main independent claim. Therefore, it is inherent that the electrode of Butler has a thickness allowing it to constitute, around and above the microdisks, a confinement volume protected from a hydrodynamic flow of a solution to be treated.

Regarding claim 32, Butler teaches that the substrate is made of silicon made conductive by doping (col. 7, lines 58-64).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

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were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 19, 20, 22-25 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Butler in view of Sugihara et al. (US 5,810,725).

Regarding claims 19, 22 and 23, Butler teaches an electrode system for an electrochemical cell that has a thin metallization layer formed on the bottom of each cavity that has a diameter substantially the same as that of the aperture (see fig. 2, 27/28; col. 9, lines 65-68), but does not teach the option of a thick metallization layer at least partially filling each cavity.

Since applicants refer to the thick metallization layer as "optional," this language does not make the thick metallization layer necessary. Claims 19 (and thus claim 22) only further limit claims 17 and 18 when the thick metallization is not an "optional" feature. Because claim 19 does not actually require the use of the thick metallization layer, it does not further limit claims 17 and 18 and the thick metallization layer is not a required part of applicants' invention and therefore, does not have to be examined.

However, if applicants were to reword claim 19 to make the thick metallization layer a necessary component of their invention, Sugihara et al. (figure 3, 5-8; col. 7, lines 65-67; col. 8, lines 1-9) teach an electrode comprising an electrode in a cavity with that is filled with a thick metallization layer.

Therefore, it would have been obvious to one skilled in the art to include a thick metallization fill layer in the cavity of Butler as taught by Sugihara et al. because a thick metallization fill layer is conductive, but will protect the electrode from the corrosive effects of ions such as chlorine and improve conductivity.

Regarding claim 20, Butler (figure 2, 27/28) teaches a thin metallization comprising a multilayer formed from an adhesion layer and a conducting layer (col. 3, lines 35-39). Butler teaches an electrode made of gold formed on a chromium layer. It is well known that chromium and titanium provide good adhesion to silicon substrates.

Regarding claim 24, since claim 19 specifically makes the thick metallization layer “optional” and not a specific limitation, claim 24 does not further limit claim 1 or claim 19. However, as stated above in claim 19, Sugihara et al. teach a thick metallization fill layer, while this layer is not flush with the top of the substrate, the layer fills the cavity. Applicant’s specification does not provide any insight as to why the filling of the cavity to be flush with the substrate is essential.

The Federal Circuit has held that, where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. *In Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), MPEP 2144.04 IV, A. Therefore, Sugihara et al. teach a cavity which is filled, whether the cavity is filled to be flush with



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the top or extends over the top will provide improved conductivity and protective ability against corrosive effects.

Regarding claim 25, since claim 19 specifically makes the thick metallization layer “optional” and not a specific limitation, claim 25 does not further limit claim 1 or claim 19. However, Butler teaches the use of having a thin film polymer filter membrane deposited flush with the top of the cavity (abstract).

Therefore, it would have been obvious to one skilled in the art to include a thin membrane layer covering the cavity in Butler because it is well known that membrane layers can be used to protect electrodes by providing gas/ion specific barriers.

Regarding claim 31, Butler teaches an electrode that meets the limitations specified in applicants’ main independent claim. Therefore, it is inherent that the electrode of Butler has a thickness allowing it to constitute, around and above the microdisks, a confinement volume protected from a hydrodynamic flow of a solution to be treated.

4. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Butler and Sugihara et al. as evidenced by Sun et al. (US 2002/0149040 A1).

Regarding claim 21, Butler teaches an electrode for an electrochemical cell, but does not teach an adhesion layer comprising titanium and the conducting layer comprising platinum.

Examiner is taking official notice that it is well known in the sensor and semiconducting art that titanium and chromium are used as adhesion layers to silicon

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substrates. Additionally, it is well known in the art that platinum is used as a conducting layer. MPEP 2144.03.

Sun et al. evidences an electrode (figure 2, 74/76; section 0037) in which titanium is used as the adhesion layer and platinum is used as the electrode (i.e. conducting layer).

Therefore, it would have been obvious to one skilled in the art to modify the electrode of Butler to have a titanium adhesion layer and a platinum conducting layer as taught by Sun et al. because titanium and platinum are used extensively in the sensor art for these purposes.

5. Claims 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Butler and Sugihara et al. in view of Madore et al. (*Environmental Sensing Potential with Arrays of Boron-Doped Diamond Microdisk Electrodes*, 4th International Symposium on New Materials for Electrochemical Systems, July 9-13, 2001, pages 23-25).

Regarding claims 26-28, Butler teaches an electrode for a sensor, but does not teach that the generator electrode comprises a portion of diamond.

Madore et al. teach boron doped diamond electrodes (i.e. electrodes can comprise diamond). Madore et al. teach that diamond is particularly suitable for electroanalytical applications due to its wide working potential in aqueous electrolytes, low and stable voltammetric and amperometric background currents, chemical inertness, long-term response stability, and a wide working potential window (page 23; paragraph 3 and 5).

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Therefore, it would have been obvious to one skilled in the art to use a generator electrode that comprises diamond in Butler as taught by Madore et al. because diamond is particularly suitable for electroanalytical applications due to its wide working potential in aqueous electrolytes, low and stable voltammetric and amperometric background currents, chemical inertness, long-term response stability, and a wide working potential window.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer Dieterle whose telephone number is (571) 270-7872. The examiner can normally be reached on Monday thru Friday, 8am to 5pm (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sines can be reached on (571) 272-1263. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMD  
6/18/09

**/Brian J. Sines/**

**Supervisory Patent Examiner, Art Unit 1795**